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[Title in German of the object of the Auslegeschrift:]
Vorrichtung zum Zerstäuben von pulverförmigen Stoffen

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DEVICE FOR THE PULVERIZATION OF POWDERY MATERIALS

The invention pertains to a method for the pulverization of powdered materials by means of compressed air, and is particularly suitable for the application of magnetic flaw-detection powder for magnetic flaw-detection testing* [*Translator=s note: Also known as magnetic crack-detection testing; Magna-Flux⁷ testing; magnetic powder test]. In doing so, the powder, which is in a storage tank, should be pulverized by means of compressed air, and applied

onto a specified spot.

In accordance with the invention, a transverse borehole of a piston, which can be displaced within a cylinder, and is connected to [a source of] compressed air by means of an axial borehole, covers - one after another - each one of two openings in the cylinder wall-system over the course of the displacement of the piston. In doing so, one of the openings directly leads to a discharge or outlet nozzle, while the other one is connected to a storage chamber for the powdered material. The air, ingressing the storage chamber, whirls the powdery material, and after that - mixed with powder - reaches the outlet nozzle. In neutral position [initial position or unoperational or unoperated position], the piston is functionally kept by means of the spring force [elastic force] in an end position, in which the transverse borehole of the piston is closed by the cylinder wall-system.

When the piston is retracted, the transverse borehole is first of all connected to the opening, which is directly leading into the outlet nozzle. Should the piston be completely retracted, the transverse borehole covers the next opening in the cylinder wall-system, which opening leads into the storage chamber for the powdered material. In doing so, the compressed air enters storage chamber, and blows the powdered material upon the workpiece to be investigated. If too thick a powdered layer reaches a certain spot, the piston is allowed to slid back so that the compressed air directly enters the outlet nozzle, and the [excess] powder can be blown off from spots that have been covered with too much powder. Should the work be interrupted, the piston is set free, and as a result of this, slides under the action of the spring force into an end-position so that neither compressed air nor air-powder mixture can egress.

It is functional to impart to the device in accordance with the invention a handy,

manageable outer shape, resembling a pistol. In that case the operator can hold the device with one hand, and carry out entire control moves or manipulations with the same hand.

The drawing shows an exemplified embodiment for a device, designed in accordance with the invention. Thus, the lower part of the diagrammatic representation is a side view, and the entire remaining part is a section.

The device has the external form of a pistol. On the place of the barrel, there is arranged the entire discharge or outlet nozzle 9 for the air-powder mixture. The compressed air is introduced in the handle 12. In the direction of the barrel, in front of the barrel, there is located the storage chamber 6 for the powdered material. Almost perpendicularly to the handle, in the upper part, there is arranged the control piston 3, which can be displaced inside a cylinder borehole 10. The piston [3] is provided with an axial borehole 13 and a transverse borehole 14, and can be shifted by means of the trigger 2. A helical spring 11 presses the piston into its left end-position or final position. Two boreholes 5 and 15 discharge into the cylindrical borehole 10. The borehole 5 leads directly to the rear part of the outlet or discharge nozzle 9, while a small tube 16 is screwed into the borehole 15, which small tube 16 discharges on the end into a nozzle 7. The storage chamber 6 possesses a relatively large lateral filler opening 8, which is sealed or plugged by means of a knurled screw 17. The piston 3 is yet provided with a sealing ring 4 so that in the left, end- position compressed air cannot reach borehole 5 or 5 by way of the transverse borehole 14.

To the connecting short branch pipe 1, there is connected a compressed-air hose for the operation of the pulverization device. Through the hollow handle 12, the compressed air ingresses the right end of the cylinder 10 and the transverse borehole 13 of the piston 3. By means of the

spring 11, the piston is pressed to the left, and its transverse borehole 14 is closed by the cylinder wall-system. Therefore, the compressed air cannot escape out of the piston. The sealing 4 prevents an escape of the air along the outer piston walls. The storage chamber 6 is filled up with powder, and plugged or sealed by means of the screw plug 17. In order for the powder to be blown upon the workpiece to be tested or investigated, the device 12 is held by the handle 12, and the trigger 2 is completely pulled back. In doing so, the transverse borehole 14 of the piston 3 is situated above the borehole 15. The compressed air can ingress the small tube 16, and flow out of the nozzle 7. The powder inside the storage chamber is whirled under the effect of the compressed air, and the air-powder mixture, which is thus originating as a result of this, enters the discharge nozzle 9 by way of the opening 18, and is blown out on the left end of the nozzle.

If too much powder has been deposited on a certain spot of the workpiece surface, the hold on the trigger 2 is relinquished so that the piston 3 under the action of the spring 11 can slide to the left until the transverse borehole assumes a position above the opening 5. The compressed air enters now directly the right end of the discharge nozzle 9. The air, which escapes from the left end of the nozzle 9, does not entrain any powder, and the excess powder layer can be blown away from the workpiece. If the work is completed, one has to relinquish his/her hold on the trigger 2 whereby the control piston 3 is completely pressed to the left by means of the spring 11, and the transverse borehole 14 is closed. As a consequence of this, neither air nor powder mixture can escape.

PATENT CLAIMS

1. Device for the pulverization of powdered materials by means of compressed air, preferably for the application of magnetic flaw-detection [crack-detection] powder for the magnetic flaw-detection* [*Translator's note: Also known as magnetic (surface-)crack detection; Magna-Flux testing⁷; magnetic powder test] , characterized in that a transverse borehole of a piston, which can be displaced within a cylinder, and which is connected to an axial borehole to a [source of] compressed air, covers - one after another - each one of two openings in the cylinder wall-system over the course of the displacement of the cylinder, respectively, one of which openings directly leads to a discharge nozzle while the other one leads to a storage chamber for the powdery material, from which storage chamber, the air - after having whirled the powdered material - [and] mixed with powder, reaches the discharge nozzle.

2. Device as claimed in claim 1, characterized in that by means of the spring force, the piston in neutral position [initial position; unoperated position] is kept in an end-position , in which its discharge opening is closed by means of the cylinder wall-system.

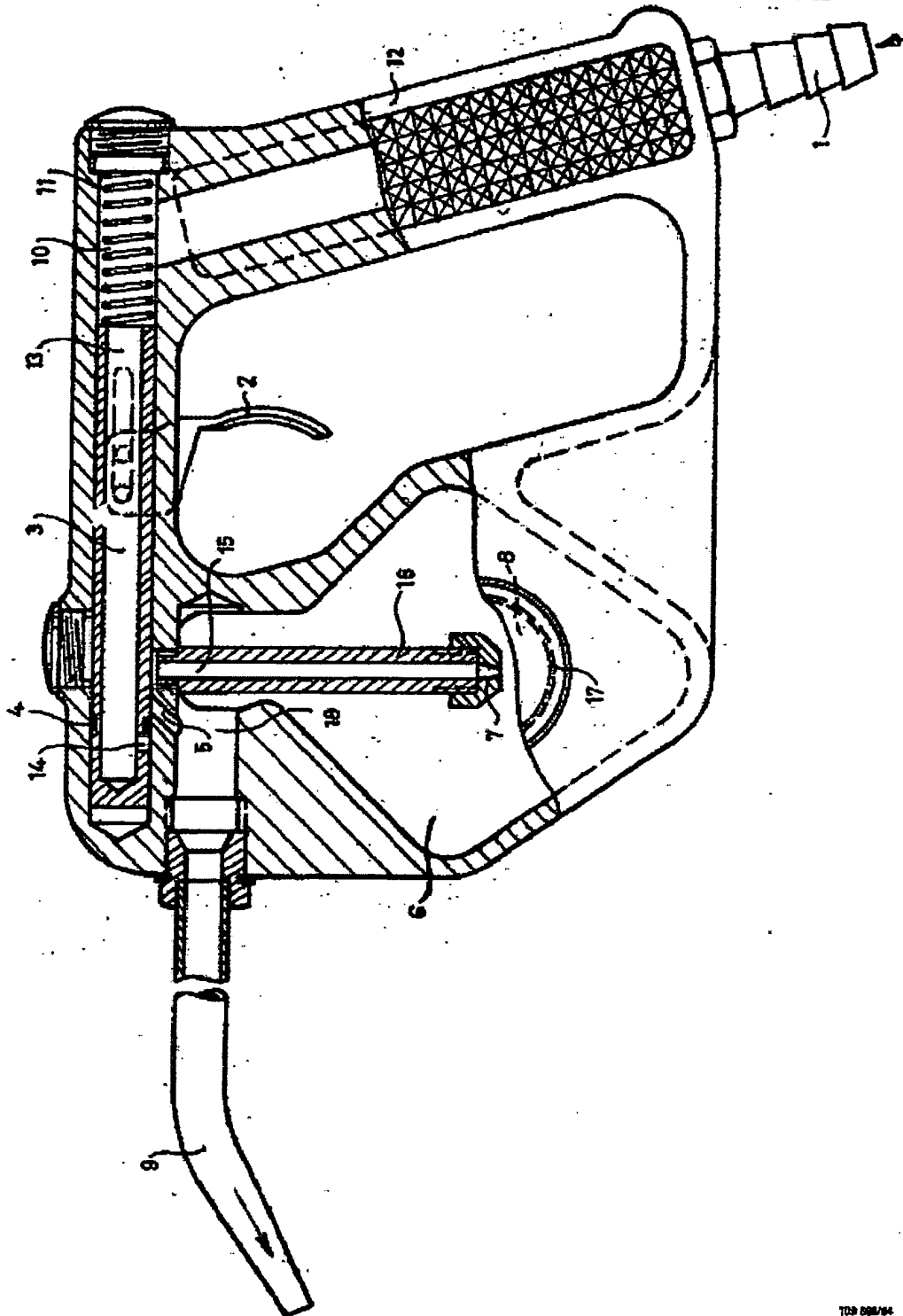
3. Device as claimed in claim 1 and 2, characterized by a handy or manageable, outer shape, resembling a pistol, having the compressed-air feeding in the handle, the discharge nozzle as pistol barrel, and control piston, which can be displaced by means of a trigger, and which is almost perpendicular to the handle.

4. Device as claimed in claim 1 and subsequent claims, characterized in that the storage chamber for the powdered material is arranged in the direction of the discharge nozzle, in front of the pistol handle.

5. Device as claimed in claim 1 and subsequent claims, characterized in that the filling opening of the storage chamber is plugged or sealed by means of a screw, e.g., a knurling or

knurled head [knob], which can easily be unscrewed by hand.

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